IN THE CLAIMS:

A full listing of the claims, including any amendments made by this paper, is provided below:

1. (Currently Amended) A detector comprising:

a base having a recess formed therein;

a diaphragm generally extending across said recess; and

an infrared sensitive component or a piezoelectric or piezoresistive element ~~located on, above or~~ supported by said diaphragm, said diaphragm including a benzocyclobutene material which is generally resistant to liquid chemical etchants and which has a thermal conductivity of less than about 0.005 $Wcm^{-1}K^{-1}$, wherein said diaphragm has a thickness of between about 0.1 and about 10 microns.

2. (Original) The detector of claim 1 wherein said diaphragm material has an etch rate of less than about 0.01 nanometers/minute when exposed to liquid chemical etchants.

3. (Original) The detector of claim 1 wherein said base has an etch rate of greater than about 1 micron/minute to a liquid chemical etchant, and wherein said diaphragm material has an etch rate of less than about 0.01 nanometers/minute to said liquid chemical etchant.

4. (Original) The detector of claim 1 wherein said diaphragm material is generally resistant to anisotropic chemical etchants.

5. (Original) The detector of claim 1 wherein said diaphragm material is generally resistant to KOH or TMAH liquid chemical etchants.

6. (Original) The detector of claim 1 wherein said diaphragm material is photodefinable or photopatternable.

7. (Original) The detector of claim 6 wherein said diaphragm material hardens, cures, softens, or becomes removable upon exposure to electromagnetic radiation.

8. (Original) The detector of claim 7 wherein said electromagnetic radiation is ultraviolet radiation.

9-10. (Canceled)

11. (Original) The detector of claim 1 wherein said diaphragm has a thickness of less than about 5 microns.

12. (Original) The detector of claim 1 wherein said diaphragm has a surface area of less than about 4 mm^2.

13. (Original) The detector of claim 1 wherein said base has a thermal conductivity at least about 10 times greater than the thermal conductivity of said diaphragm material.

14. (Original) The detector of claim 1 wherein said diaphragm material has a Young's modulus of less than about 10 GPa.

15. (Original) The detector of claim 1 wherein at least part of said diaphragm is located above said recess, and at least part of said diaphragm is not located above said recess.

16. (Currently Amended) The detector of claim 15 wherein said detector includes said infrared sensitive component and part of said infrared sensitive component is ~~located on, above, or~~ supported by said part of said diaphragm located above said recess, and wherein part of said infrared sensitive component is ~~located on, above, or~~ supported by said part of said diaphragm not located above said recess.

17. (Original) The detector of claim 1 wherein said infrared sensitive component includes at least one property that varies when said infrared sensitive component is exposed to infrared radiation, and wherein said variation in said property can be sensed by instrumentation.

18. (Original) The detector of claim 1 wherein said infrared sensitive component generates an electrical signal when said infrared sensitive component is exposed to infrared radiation, and wherein said electrical signal can be sensed by instrumentation.

19. (Original) The detector of claim 1 wherein said infrared sensitive component includes a thermopile.

20. (Original) The detector of claim 19 wherein the pitch of said thermopile is less than about 500 microns.

21. (Original) The detector of claim 19 wherein said thermopile includes a plurality of thermocouples, each thermocouple including a pair of legs having Seebeck coefficients of opposite value.

22. (Original) The detector of claim 21 wherein each thermocouple includes a hot junction and a cold junction, and wherein each hot junction is located above said recess and each cold junction is not located above said recess.

23. (Original) The detector of claim 1 further including at least one output pad electrically coupled to said infrared sensitive component or piezoelectric or piezoresistive element such that said infrared sensitive component or piezoelectric or piezoresistive element is operatively connectable to an external device via said output pad.

24. (Original) The detector of claim 23 wherein said output pad is located on, above, or supported by said base.

25. (Original) The detector of claim 1 wherein said infrared sensitive component includes Bi-Sb-Te-Se alloys.

26. (Original) The detector of claim 1 wherein said infrared sensitive component includes polysilicon.

27. (Original) The detector of claim 1 further including an infrared radiation absorbing material located on at least one side of said diaphragm.

28. (Original) The detector of claim 1 wherein said base has a thermal conductivity of greater than about 0.1 $Wcm^{-1}K^{-1}$.

29. (Original) The detector of claim 1 wherein said base has a thickness of between about 50 and about 1000 microns.

30. (Original) The detector of claim 1 further including a diaphragm adhesion layer located between said diaphragm and said infrared sensitive component or piezoelectric or piezoresistive element.

31. (Original) The detector of claim 30 wherein said diaphragm adhesion layer is titanium or chromium.

32. (Original) The detector of claim 1 wherein said detector is an infrared radiation detector and does not include a piezoelectric or piezoresistive element located on, above, or supported by said diaphragm.

33. (Withdrawn) The detector of claim 1 wherein said detector is an ultrasonic detector and does not include an infrared sensitive component located on, above or supported by said diaphragm.

34. (Withdrawn) The detector of claim 1 wherein piezoelectric or piezoresistive element has a gauge factor of greater than about 1.

35. (Withdrawn) The detector of claim 1 wherein said piezoelectric or piezoresistive element is made of or includes semiconductor materials.

36. (Currently Amended) The detector of claim 1 wherein said infrared sensitive component or piezoelectric or piezoresistive element is indirectly ~~located on, above or~~ supported by said diaphragm such that at least one material is located between said infrared sensitive component or piezoelectric or piezoresistive element and said diaphragm.

37. (Original) The detector of claim 36 wherein said at least one material is an adhesive layer to improve the adhesion of said infrared sensitive component or piezoelectric or piezoresistive element to said diaphragm.

38. (Original) The detector of claim 36 wherein said at least one material is a passivation layer.

39. (Original) The detector of claim 1 wherein said diaphragm material has a curing temperature of less than about 450°C.

40-44. (Canceled)

45. (Currently Amended) A method for forming a detector comprising the steps of:

providing a base;

forming or locating an infrared sensitive thermocouple component on said base;

forming or locating a benzocyclobutene diaphragm on or over said infrared sensitive thermocouple component, said diaphragm having a pair of opposed major sides,

wherein said infrared sensitive thermocouple component is entirely located on only a single side thereof; and

removing at least part of said base to form a recess such that said recess is located below at least part of said infrared sensitive thermocouple component, wherein said diaphragm has a thickness of between about 0.1 and about 10 microns.

46. (Original) The method of claim 45 wherein said removing step includes removing substantially all of said base located below at least part of said diaphragm in a direction extending generally perpendicular to said diaphragm.

47. (Original) The method of claim 45 wherein said diaphragm material is generally resistant to liquid chemical etchants.

48. (Original) The method of claim 47 wherein said diaphragm material has an etch rate of less than about 0.01 nanometers/minute when exposed to liquid chemical etchants.

49. (Original) The method of claim 47 wherein said base has an etch rate of greater than about 1 micron/minute to a liquid chemical etchant, and wherein said diaphragm material has an etch rate of less than about 0.01 nanometers/minute to said liquid chemical etchant.

50. (Original) The method of claim 45 wherein said diaphragm material is photodefinable or photopatternable.

51-52. (Canceled)

53. (Original) The method of claim 45 wherein said second forming or locating step includes forming or locating said diaphragm such that said diaphragm has a thickness of less than about 5 microns.

54. (Original) The method of claim 45 removing step includes removing at least part of said base to form said recess such that at least part of said diaphragm is located above said recess and at least part of said diaphragm is not located above said recess.

55. (Canceled)

56. (Original) The method of claim 45 wherein said first forming or locating step includes forming or locating a plurality of thermocouples on said base, each thermocouple including a pair of legs having Seebeck coefficients of opposite value.

57. (Previously Presented) The method of claim 45 wherein said infrared sensitive thermocouple component includes Bi-Sb-Te-Se alloys.

58. (Previously Presented) The method of claim 45 wherein said infrared sensitive thermocouple component includes polysilicon.

59. (Previously Presented) The method of claim 45 further including the step of forming or locating at least one output pad on said base such that said output pad is electrically coupled to said infrared sensitive thermocouple component such that said infrared sensitive thermocouple component is operatively connectable to an external device via said output pad.

60. (Original) The method of claim 59 further including the step of etching said diaphragm to expose said at least one output pad.

61. (Original) The method of claim 45 further including the step of depositing an infrared radiation absorbing material on at least one side of said diaphragm.

62. (Previously Presented) The method of claim 45 wherein said base has a thermal conductivity of greater than about 0.005 $Wcm^{-1}K^{-1}$.

63. (Original) The method of claim 45 wherein said base has a thickness of between about 50 and about 1000 microns.

64. (Currently Amended) The method of claim 45 further including the step of, prior to said first forming or ~~depositing~~ locating step, forming or locating a wafer adhesion layer on said base, and wherein said infrared sensitive thermocouple component is located on, above or supported by said wafer adhesion layer.

65. (Original) The method of claim 64 wherein said wafer adhesion layer is titanium or chromium.

66. (Previously Presented) The method of claim 45 further including the step of, prior to said second forming or depositing step, forming or locating a diaphragm adhesion layer on said infrared sensitive thermocouple component.

67-70. (Canceled)

71. (Original) The method of claim 45 wherein said diaphragm material has a curing temperature of less than about 450°C.

72. (Previously Presented) The method of claim 45 wherein said base includes a passivation layer located thereon, and wherein said removing step exposes said passivation layer.

73. (Currently Amended) The method of claim 72 further comprising the step of, after said ~~etching~~ removing step, removing said exposed passivation layer.

74-89. (Canceled)

90. (Previously Presented) The method of claim 45 wherein at least one surface of said infrared sensitive component or piezoelectric or piezoresistive element is generally exposed or is covered only by a material that is generally transparent to infrared radiation such that infrared radiation emitted by an external source in a direction generally perpendicular to said diaphragm can be detected by said infrared sensitive component or piezoelectric or piezoresistive element.

91. (Previously Presented) The method of claim 45 wherein said thermocouple includes a pair of legs having Seebeck coefficients of opposite value.